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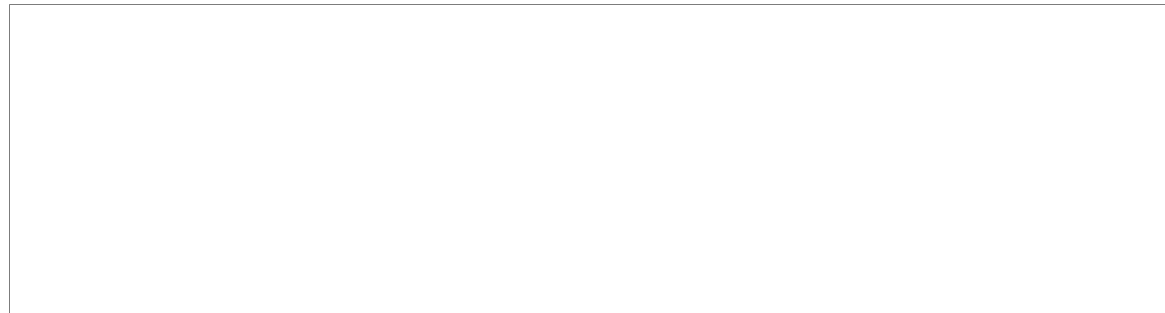
SUBJECT Technical and Economic Report Regarding the Ceramics and Refractory Industries

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INTRODUCTION

1. The present report encompasses the territories of Czechoslovakia, Hungary and Austria. The main ceramics plants are described; the many small brick kilns have little significance, but all the major and more important establishments are listed and described.
2. report embraces the following:
3. The report on each country is supplemented by a short discussion of the geologic formations from which the raw materials used originate.

HUNGARY

4. The ceramics raw materials in the territory of present-day Hungary are, only with a few exceptions, of minor significance. They originate in the formations of the Quaternary era, particularly from the alluvian and diluvian younger

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formations, and are also found in the secondary deposits of sedimentary origin (swept in by water). These raw materials (clay and pure clay) are mostly contaminated with lime or organic matter and are suitable only for the production of ordinary stones for building purposes. These stones could withstand a maximum of 1700 to 1800 degrees Fahrenheit in heat. Quite frequently these types of stones can only be used for the construction of a maximum of two or three-story houses, owing to the lack of pressure resistance. This raw material of inferior quality governs the character of the Hungarian ceramics industry.

5. All plants which produce quality products are forced to import their main raw materials (refractory clay, magnesite, kaolin etc). In spite of this handicap, Hungary boasts a few ceramics factories which produce first-class merchandise. These products are not only used in domestic trade but are also exported and very necessary in case of war. This fact is listed in addition when the individual plants are discussed.

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7. The ceramics industry, like most of Hungary's other industry, was mainly dependent on coal as its source of power. This followed Hungary's loss after World War II of practically all of the mountain border regions which have usable water power. Hungary was only able to make use of a very few locations which offered water power in sufficient quantities to keep idle electric plants in operation. Electricity thus produced was by far short of the requirements and consequently large areas of the country were without electric power and light. In order to improve this situation various projects were under consideration, particularly following the discovery of rich bauxite deposits in the vicinity of the Bakony forest, since large amounts of electric power are necessary to reduce bauxite to aluminum. Various power stations were built mostly operated by coal in the vicinity of coal mines (Varpalota, Matranovak). Hungary has relatively plenty of coal deposits but they are not very rich. Almost predominantly the coal is from the younger geological formations such as lignite and brown coal with a heating value between 2500 and 6000 calories. Only in a very few places (Tata, Dorog, Pecs, Szaszvar-Maza) black coal is being mined with a heating value in excess of 6000 calories. Black coal, suitable for coking, or anthracite, is not found in Hungary. The stock of coal is mainly imported from the Ruhr area. Various hydro-generating plants were erected which improved the quality of the lignite and brown coal and thus these heating materials were frequently used in the ceramics industry.

8. Since there was an insufficient amount of electric power at the disposal of the industry, the electrically powered tunnel kilns were almost unknown to Hungary. Chamber kilns, made by Hoffmann and Zigzag kilns /sic/ are in use. However, a large percentage of the brick kilns still use the primitive field kiln.

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9. Also being considered was the use of natural gases which in Hungary occur in the vicinity of Hajdusoboszlo and in the vicinity of the oil wells in Lispe, for firing of ceramics products.

There were no suitable installations. My recommendations were, There were no suitable installations on hand for capturing the gases and consequently the very highly-valued propane and butane gases with 12000 to 13000 calories in heating capacity went into the air without being used. It was only later that the construction of a pipeline to Budapest (from Nagykanizsa) was begun which, as of now (1953) is reportedly being used by the Communist government. Only the natural gases which occur in the vicinity of Kolozsvár, Marosvásárhely, and Kissarvas in Transylvania, which now belongs to Rumania, are being used successfully by some brick kilns for firing.

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10. As a result of the circumstances mentioned above and the lack of capital, the Hungarian ceramics industry was far behind in the equipment of the plants, which with only a few exceptions, were obsolete. In January 1939 the area of the former Hungary housed 362 ceramic enterprises. Of these 344 were brick factories employing a total of 15,048 workers at an average of 44.5 workers per enterprise. This would conclusively prove that human manpower was preferred over mechanical devices. In 1939 the value of the ceramics production of Hungary was at 42,841,000 pengo. This is approximately 8.25 million dollars or some 2,847 pengo per worker which is about 547 dollars. As a comparison the value of the entire industrial production of Hungary in 1939 was 3,607,780,000 pengo or about 7000 million dollars. Consequently it can be seen that the ceramics industry represented about 1.3 per cent of the industrial production of the country, but consumed about 5 per cent (270,000 tons) of the country's coal production which was 5 million tons per year. In the whole country's average in 1939, the Hungarian industrial worker earned annually 1267 pengo or approximately 243 dollars. In the ceramics industry, however, he only earned 887 pengo or approximately 170 dollars.
11. The Communist government of Hungary has, following the Soviet methods, foreseen the improvement of the ceramics production in its Five-Year-Plan. It is, however, impossible to improve the naturally inferior quality of ceramics raw materials and to alleviate the situation of non-existent power supply with slogans alone. There will most certainly be an effort to uncover new deposits of raw materials.
12. All Hungarian ceramics plants are nationalized and are at present under the jurisdiction of the Construction Ministry. 50X1  
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the following gentlemen of  
the industry were leading officials:
- Janos Grofcsik, Director of the Fine Ceramics (Precision Ceramics ?) Division  
Miklos Galdi, his Deputy  
Zoltan Lenart, Director  
Bela Mattyasovszky, Engineer, in the Porcelain Division  
Zoltan Kaldor and Alfred Hinsenkamp, both in the Refractory Stones Division  
Istvan Zeold and Miklos Naszay, both in the Brick Kiln Division
13. The capacity of the Hungarian ceramics industry between 1939 and 1944 was on the average, per year, 800 million pieces and there is no reason to suppose that these achievements are greater today. The following descriptions encompass only the larger enterprises who also produce quality merchandise and whose significance is somewhat more than the Normal Hungarian brick kiln.
14. Nagybatony-Ujlak Joint Stock Company, Budapest.--The brick works are in Budapest-Obuda; the coal mine is in Nagybatony, on the railroad track from Budapest to Salgotarjan. The ceramics factory in Budapest-Obuda was founded in 1869 and produces bricks, roof tile, facing brick, plates and all normal fired bricks. The equipment was obsolete and it was only in 1943 that modernization was begun. A new artificial drying plant was built which burned down however, from sabotage (it is suspected). The machine equipment consists of transporting devices for clay and finished merchandise, rollers, chargers, horizontal presses, open-air (and) artificial drying plant, and round chamber ovens. The raw material can withstand a firing temperature of maximum 2700 degrees Fahrenheit. The source of power is coal. Coal used to be delivered from their own mine in Nagybatony. Electric power is used as reserve energy which is piped-in over normal circuits and through transformer. The annual capacity of the factory is approximately eight million pieces and was supposed to be raised to 12 million pieces. Special products put out by this firm were insulating plates "porosit", "Haesz" and "Hahaesz"; these were made of calcium silicate, but of poor quality. The good insulating plates were the "Lyophobit Haesz" and "Aloterm". The director was Engineer Anton Muller.
15. Associated with this firm was Parafakogyar Joint Stock Company (Cork Brick Factory) which produced first-class insulation material. This material was made of clays, silicates, sawdust, and calcium. It is produced in sheets or plates from two to five centimeters thick, and 10" x 20" in size. This material goes under various names such as "Thermalit" which insulates up to 1850°F; "Superthermalit" insulates up to 2200°F; and "Kabe" as well as "Mikroporit" insulate up to 2700°F.

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16. Black Coal and Brick Factory Company, Budapest.--Originally known as "Drasche", it was a Belgian company which owns three large plants in Budapest on Rakos, Obuda and Budaörs Sts. This firm had relatively the best raw material at its disposal. It used a relatively rare type of blue-green Hungarian flint clay, which could withstand firing temperatures in excess of 2200°F. These plants are also not modern but are technically in a relatively higher position and in the ranks of Hungarian ceramics plants they occupied a formidable position. The source of energy here also is coal for steam engines and a little electric power for motors piped in from the large power station in Budaörs. The capacity is approximately 16 to 20 million pieces per year, and production consists of building brick, dry-pressed brick, hard-burned brick or face brick, refractory stones etc. Of particular importance is the production of electric insulators, chinaware (tableware), ceramic plates and drainpipes. The high quality raw material necessary for these products is imported from Czechoslovakia. The production of high tension insulators was in its infancy and not fully developed. Yugoslavia once ordered insulators but the order was returned for poor quality. This enterprise is very important for the economy of Hungary.
17. Hungarian Ceramics Factory Joint Stock Company, Budapest, Gyomroi St.--This factory produces, in addition to the normal hard-fired bricks, refractory bricks, face brick, silica brick, and the excellent ceramic brick used for the heaviest road construction. The equipment was also not modern but in relatively good shape and the capacity was anywhere from six to eight million stones or pieces, per year. Coal was the power source, as were steam engines and electric power. The high quality raw material was imported. The factory is of military significance and the production supervisor was Chief Engineer Szabo.
18. Bohn Brick Factory, Budapest and Békéscsaba.--This is a relatively large and spread-out factory, but the machinery is comparatively obsolete. The annual capacity was eleven million pieces. Since only normal or common brick clay was available, which could only resist up to 1800 F in temperature, the factory produced building brick, roof tile, and other ordinary brick products. It was powered by coal and electricity. It employed 250 workers and was of no extraordinary significance. The production superintendent was (Mrs) Mr Zolnay.
19. Salgotarjan Black Coal Company, Budapest.--This is a brick factory which uses common brick clay as its raw material. It has the customary Hungarian open-air and artificial drying installations and round chamber kilns. The equipment was mediocre. The capacity was about six million pieces per year. The power used was coal and electricity. No particular significance is attached to this factory.
20. Budapest-Szentlőrinci és tatai gőztégla és cserepegyár Joint Stock Company, Pestszentlőrinc (Budapest-Szentlőrinc and Tata Steam Brick and Roof Tile Factory Joint Stock Company in Pestszentlőrinc).--This is a brick factory with an annual capacity from seven to eight million pieces located in the suburb of Budapest. The obsolete equipment was modernized partially between 1939 through 1944 and consisted of a clay lift charger, rollers and presses. Production was centered around the common type of brick products and a few special products. Raw material varied from the very lean clay to the rich blue clay and the clay was some of the best found in the vicinity of the Hungarian capital. Its maximum refractoriness, however, did not exceed 2200 degrees Fahrenheit. The factory was powered by electricity and coal. Its director was Norbert Baratta, whose deputy was Karl Vizkelety.
21. Budapestvidéki gőztéglagyar, Solymar (The Budapest Region Steam Brick Factory in Solymar).--This is one of the most modern ceramics factories in the vicinity of Budapest and throughout Hungary. The production time from raw material to finished product was only from 168 to 180 hours. The factory is located approximately ten miles north of Budapest on the railroad line from Budapest to Esztergom. The factory uses relatively good raw material with a refractoriness of up to 2200 degrees Fahrenheit. The factory also boasts a modern preparation plant and a widespread automatic transportation system during production. There are also artificial drying plants and good round chamber kilns. Also this factory was powered by coal, steam, and electric motors. It produced all the common types of brick products and has no war significance. The capacity was seven to eight million pieces per year. The owner was Mr and Mrs Szappanos; the latter also managed the plant.

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22. Hungarian Magnesite Industry Joint Stock Company, Budapest.--This is the only ceramics plant in Hungary which produces exclusively high-quality merchandise, but from imported raw materials. The plant was erected with foreign capital and can be considered as the most modern and highly technical plant. The following products were manufactured: fire bricks, dinas [sic] brick, magnesite bricks, and other refractories important to the iron and steel industry, as well as carbon bricks important for the foundries. Their particular specialties were bauxite and corundum bricks. These were produced by adding finely ground fired bauxite with the lowest possible iron oxide and silicon oxide content, or corundum. These bricks are fired in electric ovens under temperatures ranging from 3100 to 3200 degrees Fahrenheit and correspond to the highest specifications. Another product is the chromite brick consisting of ground chrome or calcium hydroxide and caustic magnesia. These are also fired at 3100 to 3200°F. The plant is powered by coal and electricity piped in from the Bannhida power station.
23. Ceramics Factory of the Steel Works in Diosgyor.--In the vicinity of Diosgyor there was the only larger deposit of clay, in Hungary consisting of better quality primary clay and permitting the production of refractory bricks. The products of the factory are exclusively used for the iron works in the blast furnaces and air heaters, as well as steel smelting furnaces. According to a report from the British trade periodical "Claycraft" a new large brick factory was constructed this year in the community of Malye on the Bodrog river. This factory is supposed to have a capacity of from 30 to 40 million bricks a year. Thus, this factory will represent the first brick kiln of Hungary keyed to a year-round production. The drying plants can hold 750,000 bricks which are mechanically transported to the oven. The oven is four meters wide and 200 meters long and is capable of firing two million bricks at one time. Compared to the more advanced Western European conditions this is a considerable achievement. It is to be expected that this large brick factory will deliver bricks for all constructions of military importance to be undertaken in northeast Hungary and partially also in eastern Czechoslovakia. As for instance, the Kosice Iron and Steel Combine (Czechoslovakia).
24. Herend China Factory, Herend.--This is the oldest china factory in Hungary. The equipment is obsolescent [redacted] 50X1  
[redacted] The factory produced excellent table china and artistic objects from imported kaolin, predominately for export. It employed some 80 to 90 workers -- 50X1  
draftsmen and specialists. It was powered by coal and electricity. The owner was Dr Gulden, [redacted] 50X1
25. Zsoln China Factory, Pecs.--This china factory likewise processes mostly imported kaolin and produces second quality table china, porcelain pipe, insulating material and technical porcelain. Its equipment was not modern. The modernization was begun at the time World War II broke out. Clay tile and stoneware, as well as glazed pipe, were some of the things that were produced but of medium quality only. The factory was owned by the family Mattyasovszky-Zsolnay.
26. The only location for kaolin extraction in Hungary was in the community of Szegi along the railroad line from Miskolc to Satoraljaiújhegy. This deposit yields Rhylite kaolin which melts at approximately 3100 degrees Fahrenheit. This raw material is not usable for technical or tableware porcelain but is suitable for pottery, glazes, enamels and paints. Further uses are for ignition caps, torch and igniting caps and as an additive to fire brick as well as for paper products. The production of the deposit amounted to 50 tons per 16 hours, and ten workers were employed. As a source of power there was one 110 HP steam engine and a 75 KW generator. The machinery was in good shape and was at some time delivered by Germany. A second deposit of kaolin was discovered near Beregszasz in northeast Hungary. This territory, however, now belongs to the Soviet Union. The deposit here was a yellow kaolin of mediocre quality somewhat resembling that found in Szegi.

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27. The following communities or towns have brick factories: Mezotur, Gyor, Sopron, Eszterhaza, Bapa, Celldomolk, Zalaegerszeg, Szombathely, Szentgotthard, Szekesfehervar, Nagykanizsa, Pecs, Mohacs, Szoreg, Hodmezovasarhely. There were some smaller works in various communities but without much significance.
28. In summation, the following may be said: as a whole the Hungarian ceramics industry is an absolute seasonal industry because only a few factories are equipped for winter work. Only a modest significance is placed on the industry in the framework of the economy of the country. Some 90 per cent of the installations are obsolescent, being about 25 to 30 years old. Since manpower was very cheap in Hungary, little attention was paid to mechanization. Exceptionally large quantities of capital would be required for modernizing, but modernization would not effect the mediocre quality of the ceramics raw material.
29. Friedrich Siemens Steel Works in Budapest XIII.--This factory delivered various machine parts from steel castings to me. The factory produces various kinds of steel alloys including some very valuable ones -- steel alloys with chrome, manganese, vanadium, cobalt, etc. Furthermore this factory produces cast steel pipe up to 20 meters long, as well as special rods, rust and refractory steels, armored plates etc and consequently is very important for war production. The factory boasts two induction furnaces of two and five-ton capacity and two Siemens-Martin open-hearth steel furnaces, 15 and 20 tons in capacity. The factory was powered by electricity from the Banhida power plant and employed approximately 600 workers. The director was Mr Rostas, and some of the chiefs were (fnu) Baumann, (fnu) Szasz, (fnu) Jankovics.
30. Hubert and Sigmund Steel Works, Budapest I, Farto St.--This factory also delivered to me various machine parts from special castings. It produces high quality special steels from various alloys. It had two induction furnaces, two open-hearth furnaces and produced all kinds of steel castings. The power supply comes from the Banhida power plant. The director was Dr fnu Zorkoczy, the chief engineers were fnu Varga and (fnu) Szekely.
31. The activity of the Hungarian heavy industry can, in case of war, be easily interrupted since the supply of electric power originates from one or two concentrated points and when one central station /relay station/ is disconnected it automatically cuts off the power supply in a number of industrial enterprises.
32. The Hungarian bauxite industry is worthy of mention. The Hungarian aluminum ore or bauxite is the best aluminum ore. It is mostly exported since there is a shortage of the necessary electric power required for its smelting. Bauxite deposits are most frequent in the vicinity of the Bakony forest in central west Hungary.

CZECHOSLOVAKIA

33. The ceramics industry of Czechoslovakia is technically very highly developed. This is primarily caused by the fact that first-class raw materials are available in almost unlimited quantities particularly in the western parts of Czechoslovakia, in the Sudetenland. These deposits are located on either side of the German-Czech border mountains and originate from the same geologic era (mostly older than Cretaceous) as follows:
- kaolin from the era of Carbonian /Carboniferous/ Devonian, Silurian and Permian periods,  
and quartz rock likewise from the Carboniferous, Devonian and Silurian periods.
34. Many of these clay types can withstand heats of 3200 degrees Fahrenheit. The very fact that these raw materials are from the older geologic periods would lead to the conclusion that they are basic deposits resulting from weathering. It is clear of course that not all ceramics raw materials are of such a high value. There are frequent appearances of normal types of clay only suitable for production of bricks. This is the red burning material which cannot withstand temperatures in excess of 1800 degrees Fahrenheit.

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35. There is, however, a special type of clay from a younger geologic period. That is to say younger than the Cretaceous period, and this is the so-called brown coal clay which accompanies the brown coal deposits originating primarily in the Tertiary and Lias formations. This is a high-grade clay, usually without lime or other contaminants, which is used for the production of glinker brick, chemical and mechanical pottery, as an additive to refractory clay products, etc. It can withstand temperatures of up to 3000 degrees Fahrenheit; thus it comes within the first group of high-grade clays as well as in the second group and represents an independent type of clay. Its most frequent deposits are in the northwest Bohemian brown coal region, between Eger and the Elbe river, and in the vicinity of Most where it constitutes the foundation for the well-developed ceramics industry. Some of the more important centers of the ceramics industry are the area of Most, Falknov nad Ohri, Chomutov, Teplice-Sanov, and Usti nad Labem. The coal combined with this kind of clay is particularly suitable for hydration (synthetic materials and gasoline) for which purpose a large hydration plant has already been erected at Most which operates according to the Fischer-Tropsch process.
36. Since the ceramics industry of Czechoslovakia is so large   
have divided the plants into three major groups for purposes of clarity. 50X1
37. First group includes those plants which process the high-grade raw materials such as flint clay, whether it is blue, black, or gray. In addition to this all plants which manufacture porcelain from kaolin or white-burning refractory clay are also in Group I. The refractoriness temperature of the raw materials used by this group lies between 2700 and 3600 degrees Fahrenheit.
38. Group II includes plants which process raw materials with a refractoriness of 2200 to 2700 degrees Fahrenheit. The above mentioned brown coal clays belong in this group.
39. Group III includes works which process ceramics raw materials for the normal brick industry, and whose raw materials can withstand temperatures of up to 2200 degrees Fahrenheit.
40. As far as possible, all the enterprises belonging to Group I are listed. As far as possible also the important enterprises in Group II are listed. The Third Group has been completely omitted since it includes the less important brick kilns, in spite of the fact that this group includes some of the very modern brick works which produce from eight to ten million pieces per year. The latter would be important in case of war, since they would deliver building bricks in great quantities for the industrial or military purposes.  50X1
41. Should we wish to define the deposits of ceramics raw materials in Czechoslovakia by area, the following picture would transpire:
- Raw Materials for Group I.--These occur in West Bohemia, in the area between Rakovník-Pízen-Karlovy Vary and Cheb. The high-grade brown coal clays which are used by this group occur in the area of Most, Falknov nad Ohri, and Chomutov, as mentioned previously. In Moravia raw materials used by Group I have so far occurred only at Postorna near Breclav, Brezova near Brno, and Rajec nad Svitavou in small quantities. When Moravian firms produce high-grade products they receive the raw materials from the west Bohemian clay pits.
42. In Slovakia so far the only known deposit is in the vicinity of Lucenec. This region produces refractory white-burning clay at Poltar, Kalinovo, Lucenec, and Ľančovské Zálužany. This high-grade raw material, however, is utilized for building brick and roof tile. This is caused by the fact that the owners of the clay deposits have no jurisdiction over the capital invested in order to promote the production of high-grade ceramics. The only exception is the plant in Lovinobana, on the railroad line from Lucenec to Zvolen, which was equipped to manufacture highly refractory brick such as fire clay, magnesite brick, etc.

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43. Raw Materials for Group II.--These raw materials are found in Bohemia, particularly above the raw materials of Group I and consequently appear in large quantities in Most, Falknov, Chomutov, Podborany, Zatec, Zlutece, Teplice Sanov, and Usti nad Labem. The brown coal clays falling into this group are also found here. A similar deposit is in the vicinity of Prague, in the community of Modrany. In eastern Bohemia there is a predominance of a diluvial and very plastic type of clay which, however, contains up to 10 per cent lime and consequently is only of limited use. Moravia has an abundance of raw materials of Group II. In north Moravia, for example, in the vicinity of Krnov, Novy Jicin, Moravska Ostrava, Orlova-Lazy. Deposits also occur in central Moravia in Holesov-Zopy and in eastern Moravia at Hodonin. In Slovakia clays of this type are to be found at Velke Topolcany, Lucenec, Kalinovo, Poltar and Hrencarske Zaluzany.
44. Raw Materials for Group III.--This type of raw material is to be found all over Czechoslovakia in widespread deposits. The largest of these are in Bohemia south of Pilsen, northwest from Prague, in eastern and southern Bohemia. In Moravia they are predominant in the vicinity of Brno and Zlin. In Slovakia they appear in the west (Bratislava, Trnava), in the north and in the vicinity of Kosice.
45. Statistically there are some 900 different ceramics plants through Czechoslovakia which employ a total of some 50 thousand workers, or 55 workers on the average per plant. In the overall picture of industrial production for Czechoslovakia, the ceramics industry's quota was 6.5 per cent. The value of the Czechoslovak industrial production was normally 900 million to one billion dollars per year, in which the ceramics industry participated to the tune of 54 to 60 million dollars. These figures do not include the value of exported ceramics raw materials.
46. As in all Communist countries, the ceramics industry of Czechoslovakia is today nationalized and centralized. Since the Czechoslovak ceramics industry was well equipped and used modern machinery, apart from excellent raw material, and had sufficient power sources at its disposal, it can be supposed that no major problems would appear to hamper production. On the scientific or technical level the ceramics industry is well supported, because apart from the normal laboratories of the larger plants, there is a ceramics association as well as a ceramics school in Pilsen, and finally both the technical universities in Prague as well as in Brno have a chair in ceramics. The scientific research of the industry is on a relatively high level, thanks to gentlemen like Dr Barta in Prague, Dr Kallauner, and Dr Matejka in Brno.
47. ENTERPRISES IN GROUP I WHICH PROCESS HIGH-GRADE RAW MATERIALS:
- Zapadocecke kaolinove a slovenske zavody magnezitove, Praha (West Bohemian Kaolin and Slovakian Magnesite Works in Prague).--This was the largest enterprise in Czechoslovakia. Its central offices were located in Prague II, U pujcovny 9. The plants themselves were in Tremosna near Pilsen, and in Lovinobana in Slovakia. The plants produced all types of industrially important refractory high-grade bricks, as well as acid and basic content bricks, bricks for glass smelting ovens, fire-clay, magnesite and other products important to the iron and steel industries. The capacity could have been around 20 to 25 million pieces per year, as far as this can possibly be expressed in figures. The machinery is modern and the installations were well-equipped. The plants are powered by coal and electric power, partially produced by their own power plant and partially piped in from the high tension network. In case of war these enterprises are extremely important. Leading persons were: Bohumil Rudl, Zdenek Havlu, (fnu) Horica, and (fnu) Konias.
48. Rakovnicke a postorenske keramicke zavody, Rakovnik (Rakovnik and Postorna Ceramics Enterprises in Rakovnik).--These enterprises had factories at Rakovnik in west Bohemia and Postorna in southern Moravia. The factory at Rakovnik processed the raw material which occurred locally and is quite high-grade and burns with a white color. It produced various kinds of refractory brick for industry, as well as building ceramics, wall plates, etc. The factory at Postorna produced refractory brick for industry, glazed pottery for industry and chemistry. The raw material used at Rakovnik was of a higher grade than that at Postorna. The machine equipment of both factories was somewhat obsolescent but capable. In 1938 modernization was started but the war intervened. The

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plants are powered by coal and electric power. Their estimated capacity is from 16 to 20 million pieces per year. Leading personages are Messrs Hinais and Cerny.

49. "Platinon" Ceramic Works in Tremosna near Pilsen--In spite of the fact that this factory's annual capacity is only from six to eight million pieces a year, its products were excellent and it was extremely active in the export trade. The factory produced all refractory type bricks for industry as well as glazed ceramics for the chemical and building industries. [redacted] The power supply, likewise, depended on coal and electricity and this factory was of military importance. The director was Mr Machacek. 50X1
50. Bratri Mrackove (Mracek Brothers) Ceramic Works in Tremosna near Pilsen--This is a factory with five to six million pieces a year capacity. It produced refractory brick for industry and glazed ceramics. The factory was not quite so well managed as the Platinon Works, since one of the Mracek brothers was more interested in alcohol than in management. The products, however, were first-class. Mechanical equipment was approximately 15 years old and the power source was coal and electric power. The factory was owned by the Mracek brothers. 50X1
51. Antonin Kadlec Ceramics Works in Brasy near Pilsen--This is a ceramics factory of the same size and capacity as the above mentioned concern. [redacted] The factory produced refractory brick for industry and glazed ceramics. Likewise the factory was powered by coal and electricity. It was owned by Mr (fnu) Bilek. 50X1
52. Ceramics Works of the Iron Works in Kladno--(Poldi-Hutte) This factory produces the refractory brick for use in its own foundries. The high-grade raw material is imported. The factory is powered by the iron works. Production capacity is approximately two and one-half million pieces per year. Militarily speaking, this relatively small factory is important considering the iron works which produce high-grade special steels, armored plates, rust and acid resistant steels known as Poldi steel. The entire factory used to belong to the Prazska zelezarska spolecnost (Prague Iron & Steel Company).
53. Sedlecke kaolinove a porcelanove zavod, Sedlec u Karlovyh Varu (Sedlec Kaolin and Porcelain Enterprises in Sedlec near Karlovyh Varu)--This is the most important factory in Czechoslovakia which processes high-grade kaolin and produces china of all types. This factory produced insulators resisting up to 500 thousand volts tension as well as almost all types of high-grade industrial china for radio instruments, transmitters, short wave instruments, automobile plugs, china tubes etc. The installations for preparing kaolin as well as for production installations were modern and, militarily speaking, the factory was eminently important. There is a laboratory and very well-equipped testing installations [redacted] experiments with insulators etc. The main source of power was electricity which is partially produced by its own power plant and partially piped in. There was a second factory attached at Merklin. This was not quite so big and produced insulators resisting currents of only up to 45,000 volts. Apart from that, it produced the same recognized system of enterprise and household china as well. The products are of excellent quality. 50X1
54. Vildstejn and Nova Ves Kaolin Mines at Nova Ves near Cheb--This is actually only a mine which exploits the best raw materials (clay and kaolin) and delivers them to the ceramics enterprises in Czechoslovakia and abroad.
55. Karlovarska tovarna na porcelan (Karlovy Vary China Factory in Karlovy Vary)--This is a factory which is located at Rybare, a suburb of Karlovy Vary, and which mainly produces consumer and household china as well as decorative and artistic china. Since first-class raw material was used, the quality of the products was excellent. The mechanical equipment and the technical leadership of the factory left much to be desired and the amount of scrap due to breakage was relatively high. The fact that in spite of the shortcomings, excellent merchandise was produced was due to the locally resident experts. The enterprise was constantly fighting financial difficulties. It was powered by coal and electricity piped in from the west Bohemian power plants. The products of this factory were sold both at home and abroad.

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56. The Thun Fire Brick and Kaolin Works in Chomutov.--This factory mainly produced good quality consumer china in its plant near Bilina. The production of refractory brick in the Chomutov plant was started in 1936. Financially the enterprise was very weak, the equipment was obsolescent and incapable of much production. The enterprise does not have any extraordinary significance and is only mentioned here because it processes excellent raw material.
57. Fritzsche & Thein, Praha IX, (Fritzsche & Thein in Prague IX).--This is a smaller enterprise which employs approximately 60 persons, but is militarily very important. It produces all the more important chinas and stearite pieces for the electrical industry, for radio instruments, short-wave installations, transmitters etc. The equipment of the factory was not very modern but in spite of that quite capable. Most of the work was carried on in the dry, or half-dry, state with the aid of mechanical presses, but some work was done in the wet state with snail presses particularly in the case of china pipe. The merchandise was fired in furnaces resembling the American type furnace. The power was supplied by the power stations of the capital of Prague. The owner was Mr (fnu) Thein.
60. The following was the most important ceramics major enterprise in Moravia: The Hrusov Factory for Ceramic Goods, Located at Hrusov near Moravska Ostrava.--This modernly equipped ceramics factory produced all types of high-grade ceramics products such as refractory brick, technical and chemical pottery, and the factory also has military significance. It produces all types of fire brick for the iron, steel, and metal industries. As a specialty it produced large containers for concentrated hydrochloric, sulphuric, and nitric acids. These containers were hand molded and exported. The capacity of the factory was approximately seven hundred to eight hundred cars per year, each car about 20 tons. Raw material used was partially from the factory's own clay pit and partially from western Bohemia. The factory was powered by electricity which was amply at its disposal in the vicinity of Moravska Ostrava. The factory had its own power station with steam engines which, however, didn't produce enough power. Both the preparatory stage and the production stage were well-equipped with modern equipment. The many industrial enterprises in the vicinity of Moravska Ostrava and Vitkovice (iron and steel industry, metal and chemical industry, mines etc.) were supplied by this factory.
61. Banska a hutni spolecnost, Moravska Ostrava, (Mining and Metallurgical Company, Moravska Ostrava).--This large industrial combine had a ceramics factory in Trinec in the Iron Works which produced all fire brick necessary in the Iron Works itself. The bricks were not for sale, only for use of its own iron and steel industry. There was a brick kiln located in Moravska Ostrava which produced all bricks for the use of the company. Both ceramics factories were equipped with modern equipment and supplied by power from their own sources. The capacity of the fire brick factory in Trinec was approximately one and a half million refractory stones per year, and the capacity of the factory in Moravska Ostrava was somewhere between six and seven million bricks per year.
62. The Iron Works at Vitkovice.--also owned their own fire brick factory which is well equipped and covers the requirements of the Iron Works and Steel Works with which it is connected. All the necessary bricks for iron and steel making are produced in this plant and the high-grade raw material is taken from its own clay pit. Electric power is supplied by its own power plant. The ceramics factory was headed by Dr (fnu) Spitzer.
63. Fire Brick Works Salm-Reifferscheid in Rajec nad Svitavou.--This firm produces only the fired clays necessary for the production of fire-bricks. It does not produce the bricks itself. The preparatory installation was well equipped and the capacity was from 20 to 25 cars, at 20 tons each, per month.
64. FACTORIES IN GROUP II. The factories falling into this group are numerous and only the most important and largest are listed here.

BOHEMIA

65. Frantisek Slavik Ceramics Works in Zihle.--This is a branch factory of the main concern in Hrochuv Tynec, and has a capacity of eight million pieces per year. The main concern processes a lime containing clay and thus belongs to Group III. However, the above mentioned works in Zihle processes good raw material and produces very good quality products. The factory is very well-equipped and almost completely mechanized. It is powered partially by coal, partially by electric power piped in from the west Bohemian power works. It was owned by Franz Slavik.

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66. Ceramic Works of Arnost Brummel in Most.--The factory processes mostly the brown coal clays which occur in the vicinity of Most and produces various refractory bricks of medium refractoriness used for the various industrial furnaces, gas generators, coke furnaces, glass smelting furnaces, etc. The capacity was five to six million bricks per year and the products were a very good quality. The power source was coal and electricity. The machinery was not modern; it was somewhat obsolescent and worn. The enterprise had only slight military significance. It was owned by Mr Arnost Brummel.
67. Salz Brothers, in Stod near Pilsen.--Following its construction, this factory was a modernly equipped ceramics works with a capacity of 12 to 194 million pieces per year. The raw material was of a mixed quality and consequently the main product was building brick. Only approximately 10 to 12 per cent of the capacity was utilized for refractory stones used in Pilsen and vicinity throughout industry. The factory had a power station equipped with an approximately 240 HP steam engine. It was owned by the Salz brothers.
68. Prazske akciove cihelny, (Prague Brick Kilns).--The city of Prague boasts three ceramics factories; two in Prague (Jeneralka and Vokovice) and one in Uhrineves near Prague. They process very hard flint and the products were very good. A high firing temperature had to be precisely maintained, otherwise the cooling stones would fall apart. Properly fired bricks of this type are of excellent quality, and some specialized bricks or stones were produced for the drainage system of Prague. The raw material used by the third plant in Uhrineves is not good and thus only ordinary building bricks are manufactured there. The capacity of the three concerns combined is approximately 20 million pieces per year. The two factories in Prague had good mechanical equipment; the one at Uhrineves had obsolescent equipment. All three were supplied by electric power from the Prague municipal power plants. The director of the plants was Mr (fnu) Havlu and the executive director was Mr (fnu) Balcar.
69. "Prastav", Prazska stavebni akciove spolecnost Prague II, (The Prague Construction Company, Limited).--The plant is at Modrany near Prague. Relatively good raw material was being used and technical pottery, drainpipe, and stone mangers in various shapes, were being produced. The machine equipment was somewhat obsolete but quite capable and the products were of good quality. The capacity could be listed as being 300 carloads, at 20 tons per load. The power was supplied by the Prague municipal power plants. The plant was headed by Professor Dr Rudolf Barta.
- MORAVIA
70. Slovenske akciove cihelny in Hodonin, (Slovak Brick Works Joint Stock Company in Hodonin).--This enterprise has a second factory in Devinska Nova Ves in Slovakia. It is one of the largest ceramics plants in Czechoslovakia, with an approximate output of 30 million pieces per year. A good type of blue clay was used but mostly the production was devoted to various types of building bricks and stones. The plants are very well-equipped and mechanized. Their own power plant was equipped with a 250 HP steam engine and a reserve Diesel motor of 160 HP.
71. Josef Jakisch Hodonin Brick Factory.--This factory processes good blue clay and produces all types of shaped stones for the building industry. The capacity was between eight and ten million pieces per year. The plant was very modernly equipped and well supervised. Its power plant was equipped with two diesel generators 180 and 120 HP. The plant was owned by Josef Jakisch; the director was Dr Fery Bienert.
72. Ceska uhelna spolecnost, (Bohemian Coal Company) in Orlova-lazy.--This is an important ceramics plant which processes good blue clay and produces various shaped stones for the building industry. In addition to this, the plant produces refractory brick of medium fire-resistancy for industry, particularly, however, for its own coking ovens and air ducts. A specialty which was produced at this factory was the approximately 2½-inch round clay sphere used for backfilling galleries in coal mines. These spheres were produced by a special roller and once in the pit were forced into place from a pipeline under approximately six atmospheres of pressure. The water left the

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clay and was pumped out as normal seepage.

The capacity of the plant was approximately 16 million pieces a year and the chief was Antonin Chmelicek.

73. Ceramic Enterprises in Kunwald near Novy Jitschin.--This plant processes extremely good raw material and its products were excellent. Production was centered around technical pottery, drainage pipe, and various shaped products. The capacity was eight to nine million pieces a year, but could have been doubled. The plant is extremely obsolete and neglected. The owner was old and didn't pay much attention to the plant. Its power plant was equipped with 160 HP steam engine and electric power was used as a reserve.

SLOVAKIA

74. Fire Brick Factory in Kalinovo.--This factory uses first-class raw material which occurs in abundance in this vicinity. This raw material is highly fire-resistant and could be used for high-grade products. However, owing to a shortage of capital this was not possible. Old machines are used and white and yellow stones for the building industry are manufactured. A little shaped stone is also manufactured for the building industry. Some fire brick, handmade shaped stones, chimney blocks and flashings, furnace inlays etc, are also made. The capacity was approximately three and a half to four million pieces per year. A 100 HP steam engine provided the power. The chiefs of the enterprise were the Rockar brothers.
75. In Lucenec, Poltar, and Hrnčiarske Zalužany there are other smaller ceramics plants which are of little significance but are mentioned here since they process excellent raw material which could be used to manufacture highly refractory brick.

GROUP III

76. Most of the ceramics plants in Czechoslovakia belong to this group and only the largest of them are listed here.

BOHEMIA

77. Albin Skoda Brick Factory in Pilsen.--Modern equipment, capacity eight million pieces per year, powered by electricity.
78. Fiser Brothers in Letky Libcice, near Prague.--This enterprise has a second plant in Vltavotyn near Ceske Budejovice. The plant in Letky-Libcice is obsolescent. The capacity is eight million pieces per year. The power is supplied by the Prague municipal power plants. The plant in Vltavotyn, in southern Bohemia, is modern with a five million piece annual capacity. It is also powered by electricity.
79. Frantisek Slavik, Brochuv Tynec.--This is the most modern ceramics plant in Czechoslovakia with its own laboratory and research institute. Firing was performed in tunnel kilns. The capacity was 25 million pieces per year. The plant had its own power supply and used electric power.

MORAVIA

80. Bata Brick Factory in Zlin and Otrokovice [Zlin is now Gottvaldov].--The raw material used by this factory was floated out of its deposit by strong water streams directed at it. This is a special method which, of course, is only possible if the basic raw material is not very firm. The factory produced approximately 15 million pieces a year for its own use. It was powered by electricity from the power station of the Bata Works.
81. M Lederer, in Modrice near Brno.--This is a modern plant with approximately six million pieces per year capacity. It had its own power supply with a 300 HP steam engine which also served the adjoining cannery.

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82. Kohn and Son, Brno.--This enterprise produced approximately 15 million roof tile per year, with modern equipment. It had its own power plant, with steam and electric power.

SLOVAKIA

83. Schulz Steam Brick Factory in Sucany and Turcansky Svaty Martin.--These were the biggest plants in Slovakia. They were not altogether modernized and they had their own power supply of about 300 HP each. Their capacity was about 16 to 18 million pieces per year.
84. Poprad Brick Works.--This factory which had a capacity of only three and a half million pieces per year is mentioned because it produces building material for the Svit Works which have large facilities for rayon manufacturing, plastic materials, and other products, in the neighboring communities around Batizovce. This was originally a part of the Bata firm in Zlin.
85. Kosice Brick Works.--This is the largest plant in eastern Slovakia, with eight to ten million pieces per year capacity. It is not modern and is powered by its own steam engine.
86. In conclusion, it can be said that the ceramics plants of Czechoslovakia make predominant use of artificial drying installations and utilize the heat from firing kilns and steam engines for drying. Most of the firing is done in round chamber kilns, Zig-Zag kilns, and only rarely in the modern tunnel kilns. Frequently the primitive field kilns are to be found in Slovakia and sometimes only improvised firing channels fired by wood.
87. In the china industry the most frequently used type of furnace is the retort furnace. Only plants in Group I throughout Czechoslovakia are so equipped that they can operate throughout the year. All others operate only in the summer. Consequently, the ceramics industry in Czechoslovakia is predominantly seasonal. The annual capacity figures listed in the report are meant to imply capacity per one season in the year. Normally the season began with May and ended in September -- in other words, five months of work. Naturally, firing continued sometimes until the beginning of January if sufficient dried goods were available. The quoted capacity figures consequently would be 100% higher in the case of the year round enterprises, provided that the ovens were capable of handling these quantities.

AUSTRIA

88. In spite of the fact that ceramics have already played an important part in prehistoric time and the various archaeological excavations show proof of a well developed paleontological ceramics industry, there are, today, not many modern and well-developed technically advanced ceramics plants in Austria. The causes are very simple. Firstly, Austria does not have much high-grade raw material suitable for highly refractory bricks. Secondly the kaolin found in Austria is only of mediocre quality and has only limited possibilities for high-grade technical porcelain and even then it must be mixed with imported high-grade kaolin. The only existing larger kaolin plant in Schwertberg produces tableware and majolica etc. The ceramics plants of Austria experienced great difficulties, after 1945, at the end of World War II, when Austria again became independent in production since the import of high-grade Bavarian raw materials stopped and the industry had to change over to using Austrian low-grade kaolin. Thirdly, following the end of World War I, and the disintegration of the Austro-Hungarian monarchy, Austria became an independent country but suddenly became poor. There was no capital on hand to modernize the ceramics plants and even today there are large ceramics plants which operate with 30 to 40-year old machinery. For example, the five plants of the firm Martin Steingassner in Neubau-Kreuzstetten, Wolkersdorf and Ernstbrunn.

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89. Following the Austrian Anschluss to Germany, in 1938, there was a lively tendency toward modernizing ceramics plants but ~~not much~~ was achieved because in 1939 war broke out and all projects were abandoned. Consequently, the Austrian ceramics industry can be considered somewhat weak and ancient.
90. A further factor holding back the development of the Austrian ceramics industry is the fact that Austria is poor in power and only has little domestic coal which is not high-grade. Good black coal has to be imported. Owing to its mountainous terrain, however, Austria has a certain amount of possible exploitable water energy which can be converted to power. In this regard, thanks to the American initiative and financial help, much was done after 1945. Electric power gathered in this manner, however, is by no means sufficient to cover the demands of industry and it is not to be expected the ceramics industry will be able to use electricity for firing in the foreseeable future.
91. A relatively well-developed phase of the ceramics industry is the production of small decorative objects produced in Vienna, in Gmunden (Upper Austria), and in Schwaz (in the Tyrol). These objects are mostly produced in small plants using hand labor and which have no particular economic significance.
92. A very important phase of Austrian industry is the magnesite industry which produces for export. Since 1945 the magnesite industry has registered a significant upswing. Particularly owing to the fact that the plants have been modernized and expanded, but with American capital.

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93. Austria boasts approximately 300 ceramics plants, particularly brick factories. These are particularly in the flat parts of the country, also in Lower and Upper Austria. The mountainous regions house fewer plants. The most modern plants are located in Upper Austria and they are also the ones that registered some developments since the end of World War II. ~~Since this part of Austria is in the US Zone where the economy is being boosted.~~ Opposed to this, the ceramics plants in Lower Austria cannot be expected to develop or, if so, very slowly. They are located in the Soviet Zone and many plants belong to the USINE [sic], the Soviet Industrial Management.
94.  a few factories throughout Austria which are able to produce high-quality bricks,  among them that are noteworthy, by regions.

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#### Vienna and Lower Austria

Wienerberger Brick Factory Company, Vienna I, Karlsplatz 1.--This is the largest ceramics plant in Austria and belongs to the Creditanstalt-Bankverein. The plants themselves, are located in Vienna-Inzersdorf and Leopoldsdorf. During the war the plant located on the Triester Street was badly damaged by bombs and removal of the damage has been slow. The raw material used is of good quality blue clay with medium fire-resistancy. In other words, not suitable for the production of highly refractory bricks. The plants produce all building stones for the building industry as well as technical pottery, drainpipe, etc. The capacity is 25 to 30 million pieces per year. The plant is relatively well-equipped. Recently a new kiln was built and various types of new machinery were obtained. The plant's power supply comes from its own steam engine and electricity besides. The director is Herr (fnu) Sulger.

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A G fur Grob-und Feinkeramik, Vienna IV (Joint Stock Company for Rough and Fine Ceramics production, Vienna IV-- Formerly Vienna Brick Manufacturing Company Grob Joint Stock Company).--This company acts as the Soviet administration for all ceramics plants which were commandeered by the Soviets in Austria and who belonged to the Soviet Industrial Management Commission. The largest plant is located in Vienna III and in Floridsdorf. These plants were well equipped before World War II and their capacity was 16 million bricks a year.

The Soviets have dismantled machinery from various plants and sold it to the satellite countries. The power resources used were their own power station and electric power. Production was centered mainly around stones and bricks for the building industry, since the raw material used was only ordinary brick clay. The director of the Soviet ceramics enterprises in Vienna is (fnu) Steinbrecher.

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Martin Steingassner.--This company has works in Neubau, Kreuzstetten, Wolkersdorf and Ernstbrunn. It has obsolete equipment; the quality of the merchandise is also poor and the combined capacity is approximately 18 million bricks per year. It is owned by the Steingassner brothers.

Brick Factory of the City of Mistelbach.-- it is now modern and well-equipped. The annual capacity is about six million bricks and it is powered by electricity.

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Municipal Plants of St Polten.--The holdings of the municipality of St Polten includes a ceramics factory, a sand and gravel pit, and a power station. The ceramics factory produces mostly building requisites for the city of St Polten and its capacity was estimated at four and a half million pieces per year. It is a communal municipal enterprise of the city of St Polten.

China Factory at Wilhelmsburg on the Traisen River.--In every respect this factory is a mediocre factory which supposedly now belongs to the Soviet Union Administration. At one time it was somewhat neglected and the products were not of good quality. The factory had no high-grade raw material at its disposal and used only Austrian kaolin to produce china tableware, vials and majolica. Following the Austrian Anschluss to Germany, the plant was somewhat modernized and high-grade Bavarian kaolin was imported and processed. The resulting production was centered around high-quality china, technical porcelain, percussion caps, etc. The plant is powered by electricity and coal.

The Augarten China Factory.--This is the oldest Austrian china factory and was founded some 200 years ago. It produces only household china and decorative china in its well known quality and tasteful style. The goods are mostly exported.

The only known Austrian kaolin mine is located in Schwertberg. Kaolin derived from this mine is not suitable for the production of high-grade chinas.

Upper Austria.--Upper Austria has the most modern and best-equipped ceramics factories but they only produce stones for the building industry since no refractory raw materials are available. Upper Austria has approximately 60 brick factories of which only the most important and the largest are mentioned here. The combined capacity of these brick factories is approximately 350 to 400 million pieces a year. The source of power everywhere is coal and electricity.

Obermayr, Leitl, and Eferding Brick Industry Company.--This factory was rebuilt at high cost after 1945 and is one of the most modern plants in Upper Austria. Serious technical mistakes were made, however, during the building and, consequently, the usefulness of the enterprise is very questionable. The percentage of scrap is very high. The capacity is from 14 to 16 million pieces per year. The director is (fnu) Leitl Sr; the technical director was Dr Bienert.

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Fabigan & Feichtinger, in Linz, Waldegg.--This is a well equipped and well managed plant with approximate annual capacity of 12 million pieces. The director was Mr (fnu) Hankewicz.

Auinger & Bramberger, at Utzenaich.--This company has two plants with approximate annual capacity of 12 million pieces. The director is Mr (fnu) Bramberger.

Andorfer Tonwerke, Ertl & Co, Andorf (Andorf Clay Works).--Although this factory uses good raw material, it produces only building material at about 10 million pieces per year. It has its own power station and uses electricity.

Josef Hannak at Breitenschutzing.--This is a very well equipped brick factory with approximately 15 million pieces per year capacity. The factory is actually managed by Mrs Hannak, who is a very capable and energetic woman.

Weixelbaumer K & J Wels-Haiding, as well as Wurzbürger K & E Aschet-Wels are both well equipped and well managed brick factories with each approximately eight to ten million pieces annual capacity.

#### Steiermark (Steieria)

Upper Austrian Ceramics Works in Leoben.--This factory produces all refractory brick for the iron and steel industry and of a very high quality. It is actually the only ceramics plant of its type in Austria. It is well equipped and technically well managed and processes mainly imported (from Czechoslovakia) high-grade raw materials for the Austrian iron and steel industry. This plant is consequently very important and it is lucky that it is not in the Soviet Zone.

The Bohler Brothers Iron and Steel Works at Kapfenberg.--This important industrial concern which produces various high-grade special steels has its own ceramics factory producing refractory brick for its own use.

China Factory at Fraunthal an der Lassnitz.--This factory belongs to the radio concern Ingelen and actually produces all industrial porcelains of good quality, insulators, porcelain tubes, all porcelain for the shortwave industry etc. The plant is well-equipped and well-managed and has its own laboratory. The high-grade kaolin is imported from Bavaria and from Czechoslovakia. The plant has its own power station but mainly uses electricity from the west Steieria power plant. The technical director is Mr (fnu) Prohle.

In Steieria there are also a few good and well-equipped, well-functioning, brick factories such as the:

- Steirische Baugesellschaft, at Andritz near Graz
- The Brick Factory at Premstätten
- The Lannach Brick and Clay Factory
- The Prisching Roof Tile Factory at Mureck
- The Eustacchio Brick Works at Graz (This factory has the only large-scale indoor drying plant in Austria.)

#### Carinthia

This part of Austria is very poor in ceramics plants. The only large plant which has a very large significance on the overall economy of Austria is the Austro-American Magnesite Industry in Radenthein, which has already been mentioned. Apart from this, Carinthia boasts only a few insignificant brick factories.

Tirol and Vorarlberg.--This region has only a few brick factories of which only the clay works Fritzens and Gotzis are noteworthy. Both have an annual capacity of five to six million pieces.

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95. In conclusion, it can be said that the ceramics industry of Austria is only halfway equipped and cannot be considered as modern and progressive. There is a lack of good raw materials and the power supply is very meager. Firing is done predominantly in the Hoffman type round chamber kilns. Most of the drying is done in open-air drying installations. However, construction of some artificial drying installations has begun, which are designed to utilize the waste heat from the round chamber kilns and the power plants. Only a few plants have automatic processing [redacted] [redacted] With only a few exceptions, all plants are seasonal and operate in the summer only.

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